PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Reissue Application of:	BILL L. DAVIS and JESSE S. WILLIAMSON	(
For Reissue of U. S. Patent 5,630,363	Issued May 20, 1997	(Group Art Unit:_____
	Serial No. 08/515/097	(
Filing Date:	May 20, 1999	(Examiner: _____
Serial No:	_____	(
For:	COMBINED LITHOGRAPHIC/ FLEXOGRAPHIC PRINTING APPARATUS AND PROCESS	(

DECLARATION OF RAYMOND J. PRINCE

I, Raymond J. Prince, under penalties of perjury declare and state the following:

1. I am senior technical consultant in the Technical Services Group at the Graphic Arts Technical Foundation in Sewickley, Pennsylvania. I graduated from printing management from Rochester Institute of Technology receiving a Bachelors of Science degree and have received a Masters of Science degree from South Dakota State University. A copy of my *curriculum vitae* is attached hereto as " Exhibit "A." I am an expert in the printing arts.

2. I have been asked to review U. S. Patent 5,630,363 and give my opinion as to its teachings to one of ordinary skill in the printing arts, and to respond to specific questions concerning (1) the teaching of the sentence of col. 1, line 54-55 ("Many sheetfed presses can perfect (print both sides of the paper) in one pass through the press.") as that sentence impacts the scope of the invention taught to the printing artisan, and (2) the correct interpretation of the term "over" in the specification and claims.

3. Regarding U. S. Patent No. 5,630.363 and the use of the word "over, " I would like to offer the following thoughts: The word "over" when used in the Graphic Arts Industry has many meanings. In the patent it is used in two ways, namely (First) one ink printing over (on top of) another ink, coating, colorant or substrate, and (Second). ink, colorant, or coating being printed on both sides of the sheet or substrate. Specifically , as of August 14, 1995 - and the same is true today - the term "over" means to one of ordinary skill in the printing art reading the '363 patent either "on top of" (i.e., the same side of) the substrate, or paper, or by the reference in the paragraph at col. 2, lines 49-58 to the term "perfect" with respect to offset lithography, printing on the reverse side. The claims which refer to printing in a subsequent station "over" an image previously printed means unequivocally either "on top of" or "the reverse side of." To amplify the points I offer the following:

(1.) In the first meaning we commonly use the word over when describing overprinting or what a printer would call trapping of an ink. The term refers to the transfer of a coating, ink, or other colorant to the surface of another coating, ink, colorant or substrate. The coating ink, or colorant may be wet or dry. This term has been in common usage since at least 1920 in this regard and very possibly earlier.

(2.) In the second meaning the word over describes the printing of a coating, ink, or colorant on both sides of the paper or substrate during one pass on a printing press. This can be accomplished in many ways: (a) the use of a blanket to blanket web press, (b) the use of a double ending hardback web press, (c) the use of a perfecting unit placed anywhere on a sheetfed press, (d) the use of a back printer on a sheetfed press located on any unit of a sheetfed press. The term in this case has been in use since 1880 in this regard and possibly earlier.

4. The terms "perfect" or "perfecting" in the art teaches one skilled in the art several options of printing on both sides of the substrate. One option is to "tumble" the substrate in order to print on the reverse side. I enclose as Exhibit B several literature references concerning "perfect" or "perfecting."

5. As I read the '363 patent, it covers all of the various ways a printer would apply a coating, ink, or colorant to another coating, ink, colorant, or substrate to form an image.

6. I have been a field technical auditor for Williamson Power Corporation about twenty (20) years, analyzing the technical processes Williamson uses to make its products and providing advice where I believe it is prudent to update their technology. I do this for about 25 clients, of which Williamson is one.

The undersigned declares further that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application of any reissue patent issuing thereon.

Raymond J. Prince

Date: 5/17/94

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Raymond J. Prince
Senior Technical Consultant, Technical Services Group
Graphic Arts Technical Foundation

Raymond J. Prince is a senior technical consultant in the Technical Services Group at the Graphic Arts Technical Foundation (GATF) in Pittsburgh, Pa.

A 38 year industry veteran, Mr. Prince conducts Technical Plant Assessments (TPAs) in response to technical inquiries from GATF members and industry. GATF's TPA program offers in-plant analysis of a printer's production facility and capabilities. To date, Mr. Prince has completed 730 TPAs.

As a printing specialist and troubleshooter, Mr. Prince represents technical seminars, in-plant training programs, and contributes technical information to GATF textbooks and Technical Services Reports. Additionally, he provides technical problem-solving articles called "How I See It" for *GATFWorld*, GATF's bimonthly magazine.

Mr. Prince has also co-written the GATF texts, *Solving Sheetfed Offset Press Problems* and *Solving Web Offset Press Problems*, and was the author of *Testing the Accuracy of the Step-and-Repeat Machine*, a GATF Technical Services Report.

As a lecturer and trainer, Mr. Prince teaches the following GATF seminars: "Troubleshooting in Your Printing Plant," "Paper and Ink Problems," "100+ Ideas on Producing Consistent Quality," "Solving Paper and Ink Problems in the Pressroom," "Error Prevention," "How to O.K. Color on Press," "Overcoming the Top 20 Pressroom Problems," "Slashing Make-ready," "The Future of Printing," and "Creating a Trouble-Free Prepress Department." He also presents "Color for the Production Pressroom," "Lithographic Relationships and Variable," and "Lithographic Troubleshooting" at the Rochester Institute of Technology. He has presented over 390 lectures.

Mr. Prince is a member of the Board of Directors of the National Scholarship Trust Fund (NSTF) and chairs their Marketing/Fund-Raising Committee. In 1991 he was named president of the Technical Association of the Graphic Arts (TAGA). Prior to that he served at TAGA's executive vice president. Prince has also contributed four technical papers to TAGA Proceedings, an annual compendium of scholarly technical papers. In 1996 TAGA named a graduate fellowship in his honor.

In 1992 the National Association of Printers and Lithographers named Mr. Prince Craftsman of the Year. In 1994 he received GATF's Industry Education Award, and he also achieved the Certified Quality Systems Lead Auditor Status from the Registrar Accreditation Board (RAB) of the American Society for Quality Control.

He had been a GATF technical consultant for fourteen years before he assumed the post of senior technical consultant in 1992. He previously served GATF from 1966 through 1970 as administrative and technical specialist in the Special Programs Department, where he coordinated continuing education programs, seminars, workshops, and conferences.

Upon leaving GATF in 1970 Mr. Prince joined Azoplate, a division of American Hoechst Corporation, as an application manager directing the design, development, and manufacture of graphic arts equipment. He also determined if cost and quality requirements for company products were met.

In addition to a B.S. in printing management from the Rochester Institute of Technology, Mr. Prince has an M.S. in printing management form South Dakota State University.

EXHIBIT
A

the pages together, while a layer of a high-viscosity hot-melt adhesive is used to adhere the book block to the cover. Thicker publications, such as metropolitan telephone books or heavy catalogs, use three different types of adhesives.

Most of the adhesives used in perfect binding are hot-melt adhesives, a mixture of ***resins*** and ***polymers*** which become fluid at high temperatures and dry by cooling back to a solid state. Most hot-melts achieve their best combination of flow characteristics and bonding strength when applied at a temperature between 350–400°F. In addition to hot-melts, ***polyvinyl acetate***-based adhesives are often used. These do not need to be heated in order to be applied, but require special ovens to dry. They do, however, provide a more flexible spine than do traditional hot-melt adhesives. A third type of adhesive increasing in popularity is a polyurethane reactivate (PUR) adhesive. PUR-bound materials tend to lie flatter than material bound using other adhesives, PUR bindings tend to dry faster, and tend to be more durable. PUR, however, is more expensive and emits toxic vapors when heated.

Cover Feeder. After applying the adhesive, the cover is applied to the book block. A feeding mechanism scores the cover where it is to be folded around the book block, and the cover is pressed onto the backbone. ***Nippers*** pinch the cover around the spine, while clamps press the front, back, and sides securely around the block. The bound book is then dropped onto a conveyor belt where it is sent for trimming.

Trimmer. Once the adhesive is cool, the tops of the folded signatures of the book block need to be split, and trimming around the other sides may also be necessary. Often, ***three-knife trimmers***—located in-line or off-line—can trim all three unbound sides at once. In some cases, binding is done ***two-up***, where two books are bound together as one unit. In this case, the two individual books must be split apart prior to trimming. Some books can be trimmed ***two-on***, or one book on top of another. This is more effective when used with thinner books.

Counter-stacker. The final step in the perfect binding process is the ***counter-stacker***, a device which counts the number of individual units coming off the finishing line and stacks them for shipping.

Perfect binding equipment can bind up to 18,000 units an hour, with trimming stages slowing the process down somewhat; three-knife trimmers operate only up to about 6,000 units per hour. Any overflow can be diverted directly to stackers and trimmed off-line.

Despite the name of the process, perfect binding is not truly "perfect." Inflexible adhesives can result in books not lying flat, and the spines of paperback books can often be distorted almost beyond recognition, primarily by sloppy readers. The Swedish textbook manufacturer Otava has invented the "Otabind process" of perfect binding which uses two applications of a quick-drying adhesive along the spine. The binding is reinforced with additional layers of hot-melt adhesive along both sides of the book block, which are topped with crepe paper or cloth, followed by another layer of adhesive to secure the cover. The cover, in turn, has been scored several times, which in effect creates "hinges" which make the spine very flexible.

Perfect bind is also used occasionally in conjunction with case binding, where an adhesive is applied to the spine of a book block after sewing. Many book publishers use the same book blocks for hardcovers and their corresponding trade paperbacks. If there is a significant number of hardcover books left in the warehouse, the trade paperback is produced by stripping off the cloth case and perfect binding a paperback cover onto the book blocks, rather than printing a whole new edition. This is an economical way of producing paperback versions of hardcovers which have not sold as well as had been anticipated, the only drawback being is that corrections or updates to the text cannot be made.

(See ***Binding and Finishing***.)

Perfect Casebinding

In ***binding and finishing***, a combination of two separate types of binding—***perfect binding*** and ***case binding***—in which ***signatures*** are bound together with adhesive prior to attaching the case. Perfect casebinding is performed to eliminate the ***thread sewing*** characteristic of traditional case binding.

Perfecting

The printing of the reverse side of an already-printed sheet, especially when it is performed on a ***perfecting press***, utilizing either special ***transfer cylinders*** or printing units to print on two sides during one pass through the press. See ***Perfecting Press***. Printing on the reverse side of a printed sheet by means of successive passes through a press is commonly referred to as ***backing up***.

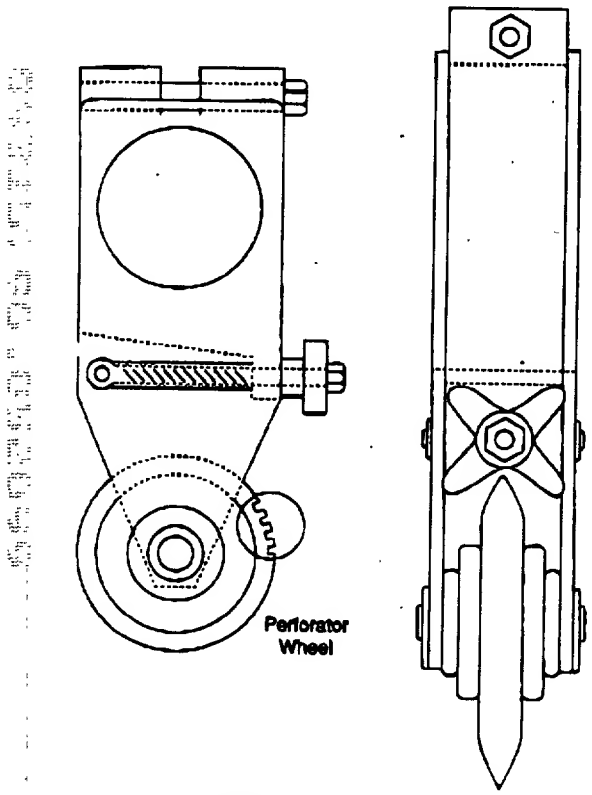
Perfecting Press

A printing press, especially one used in ***offset lithography***, that allows printing on both sides of a sheet of paper in one pass through the press. There are two basic configurations of offset perfecting presses. In a ***convertible perfector***, special ***transfer cylinders*** between successive printing units flip the paper over after it leaves the first ***impression cylinder***, allowing the second unit to print on the reverse side of the sheet. Such presses have the advantage of being able to be used for single-side multicolor printing, simply by adjusting the transfer cylinders to keep them from flipping the sheet over. A second type of perfecting press, used primarily in ***web offset lithography***, is called a ***blanket-to-blanket press***, and utilizes one printing unit in which the impression cylinder is replaced by a second ***blanket cylinder*** directly below the first. As the sheet or paper web passes between the two blankets, images are printed on both sides at the same time. (See also ***Offset Lithography***.)

Perfector
Alternate term for a ***perfecting press***, an offset press capable of printing on both sides of a sheet of paper in one pass through the press. See ***Perfecting Press***.

Perfect Press
See ***Perfecting Press***.

Perforating
In ***binding and finishing***, any operation that punches tiny slits or holes in a sheet of paper or other ***substrate***. Perforating is performed either on press or off press using perforating dies. Materials are perforated either to allow a portion to be easily removed (such as an order form or coupon), or to allow air to escape from folded signatures, which helps prevent wrinkling. The amount of paper between the perforations—called a ***tie***—can be adjusted. Perforating may also be effected directly on an offset press by means of a ***perforating rule***.



Perforating wheel.

Perforating Rule
A device used for on-press ***perforating***, consisting of a spiked strip attached to the blanket or impression cylinder of an offset press.

Perforation
A series of slits or cuts made in paper or other substrate, used for portions of a page intended to be removeable.

Perforation Tear Strength
A measure of the ease with which a ***perforation*** is torn.

Perfumed Ink
A printing ink to which has been added a small quantity of perfume (or other scent) as a means of making the printed sheet aromatic.

Perilla Oil
An oil obtained from the seeds of mints of several plants in the genus *Perilla* (most commonly *P. frutescens*) used as a drying oil in some printing ink ***vehicles***.

Period Directory
In computing, especially by means of a system utilizing a ***hierarchical file system***, the use of a single period (.) to designate the ***current directory***. The current directory's ***parent directory*** is thus designated with two periods (..) and is consequently known as a ***double-period directory***. This shorthand means of referring to directories is often used in ***DOS***, ***OS/2***, and ***UNIX*** operating systems.

Peripheral
Any hardware device connected to a computer and which is under the control of the ***CPU***. Peripheral devices include printers, modems, and any of a variety of magnetic or optical storage media.

Peripheral Component Interconnect (PCI) Bus
In computing, a ***local bus*** specification for ***personal computers***, introduced in 1992 by Intel. PCI supports up to 10 ***expansion cards*** in a single computer, so long as at least one of them is a PCI controller card. Other expansion cards including ***video cards***, ***network interface cards***, and ***SCSI*** interfaces can be added. The PCI bus operates with a bus speed of 32 MHz, with a maximum ***throughput*** of 132 ***megabytes*** per second (with a 32-bit data path) or 264 megabytes per second (with a 64-bit data path).

Permanence
A paper property that measures a paper's resistance to changes in its chemical, structural, or optical properties over time. Permanence includes such things as resistance to yellowing and fading upon exposure to light (***lightfastness***) over time, and the paper's ability to retain its strength over time. Paper permanence is measured using ***accelerated aging*** conditions, and describes its brightness loss and yellowing. A paper's retention of ***folding endurance*** over time is also a useful test for determining how well a paper will retain its strength. Some of the factors that affect a paper's deterioration over time are the deterioration of the ***cellulose*** fibers themselves (which moisture accelerates), and the use of acid-rosin ***sizing***. ***Acid paper*** tends to be less permanent than ***alkaline paper***. Permanence is related to ***durability***. (See ***Durability***.)

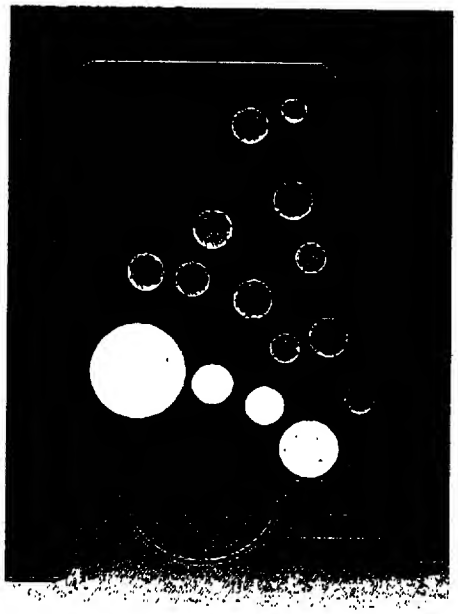
The term *permanence* also refers to the ability of a printing ink to resist fading or changing color upon exposure

Inker-Dampener Systems

Control of ink/water balance

PROVEN INKER

- The field tested and proven Akiyama Roller System is configured to provide optimum control of ink and water to the plate using an integrated continuous dampening system.
- Large diameter form rollers are a key element in the success of the Akiyama system.
- Improved ink distribution on the plate is achieved with the application of three oscillator rollers in contact with the super large form roller.
- Dampening solution feed to the plate is controlled by the operator at the delivery.
- Individual unit ink ductor roller controls are located on the delivery.



TEMPERATURE CONTROLLED INKER

Ink train and plate temperature can be critical in some applications, especially when running waterless plates. In response, Akiyama offers a system that maintains proper temperature by circulating water through the ink oscillating rollers.

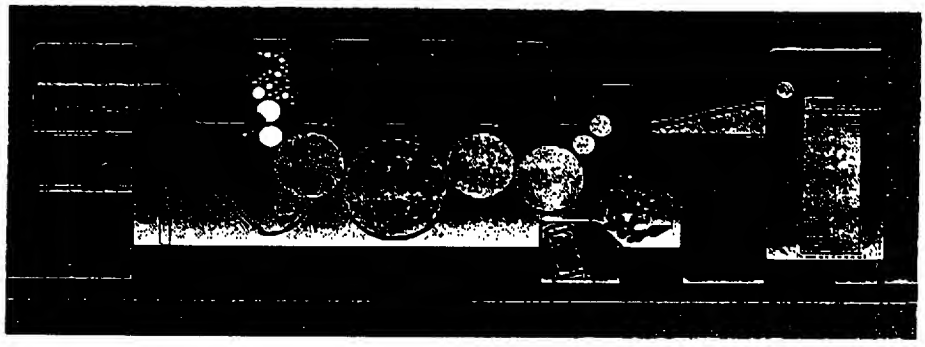
AUTOMATIC INK ROLLER WASH-UP

Remotely controlled by the operator from the delivery panel, the Akiyama wash-up system is simple and saves time with control of solution application and wash-up tray.

BT-P28 Series 28-inch Over-one Perfector

This 28" Bestech perfector series offers greater value and productivity by printing one color on the reverse side. There are four normal configurations in the series, each performing reverse-side printing on the first unit while maintaining the same gripper edge from feeder to delivery.

BT-P228 1-color reverse 2-color front
BT-P428 1-color reverse 4-color front
BT-P528 1-color reverse 5-color front
BT-P628 1-color reverse 6-color front



This perfector press is equipped with an impression to impression transfer system cylinder configuration which enables material to be printed on both sides. The configuration allows both the front and the reverse side of the sheet to be printed in the same direction, providing excellent accuracy of registration on both sides.

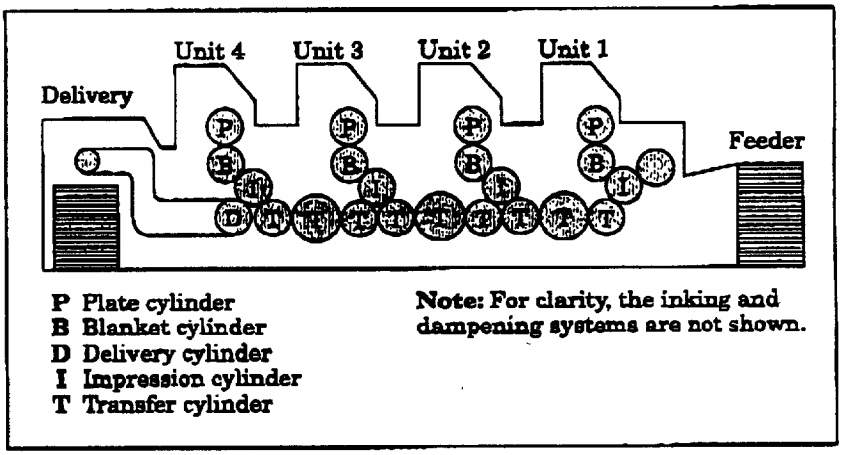
With this design, plates are prepared for all units, including the back printer, in the exact same manner with the same zero paper line and image position.
The press commonly uses UV ink for the reverse side. A UV dryer unit is shown after back printing. The higher cost of the UV ink is more than offset by savings in energy, labor, and improved efficiency.
The BT-P28 Series offers the same advanced automation packages and general specifications as the nonperfecting Bestech 28 Series.

Exceptions exist to this nearly right-angle (L-shaped) arrangement of cylinders. With one type of metal decorating press, the cylinders are stacked directly above each other so that the rigid metal sheets can pass through the printing nip (the line of contact between the blanket and impression cylinders) without being bent around the impression cylinder. Another exception is a press that has a single, oversized cylinder that is used as both the plate and impression cylinder. Yet another exception is a press that has a single oversized cylinder functioning as the impression cylinder for two printing units.

Multicolor Press

A press consisting of several printing units (each with its own inking and dampening system), a feeder, a sheet transfer system, and a delivery is called a **multicolor, or multiunit, press.** A multicolor press can have two, four, five, six, or more printing units, and two or more colors are printed in a single pass through the printing press. High-quality printing on a multicolor press depends on **wet trapping,** which is the ability of a wet, printed ink film to accept another wet ink film printed over it.

A typical four-color (four-unit) sheetfed press



In the larger press sizes, the printing units are almost identical and are arranged in tandem. With some of the other two- and four-color presses, one printing unit may be higher than the other to obtain better accessibility.

When placed in tandem, the open-unit type of single-color sheetfed press becomes a multicolor press, capable of printing a different color on each unit. One or more transfer cylinders are placed between units to transport the sheet from one

Six-color sheetfed press
Courtesy Heidelberg USA, Inc.

printing unit to the next. Some presses have three transfer cylinders between units, while other presses have a single, double-size transfer cylinder. An odd number of transfer cylinders is needed between units so that the side of the sheet to be printed faces away from the impression cylinder.

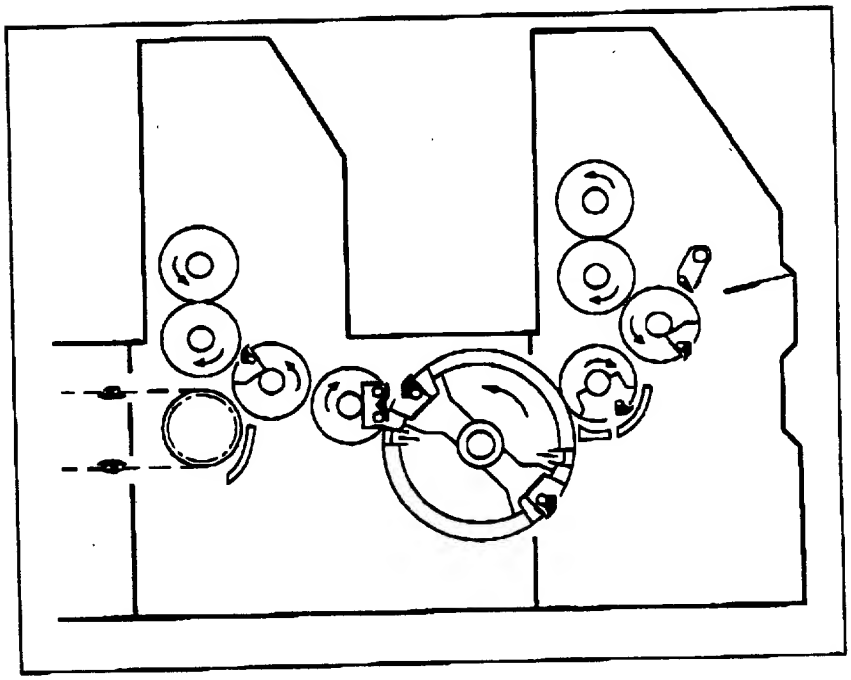
In another multicolor sheetfed press design, sometimes called the "semiopen design," a single impression cylinder serves two pairs of plate and blanket cylinders. The printed sheet is held by the common impression cylinder and successively brought into contact with each blanket. A press consisting of two semiopen units would then be capable of printing four colors on one side of the press sheet in a single pass.

Eight-color sheetfed semiopen press
Courtesy MAN Roland Inc., Sheetfed Press Division

Perfecting Press

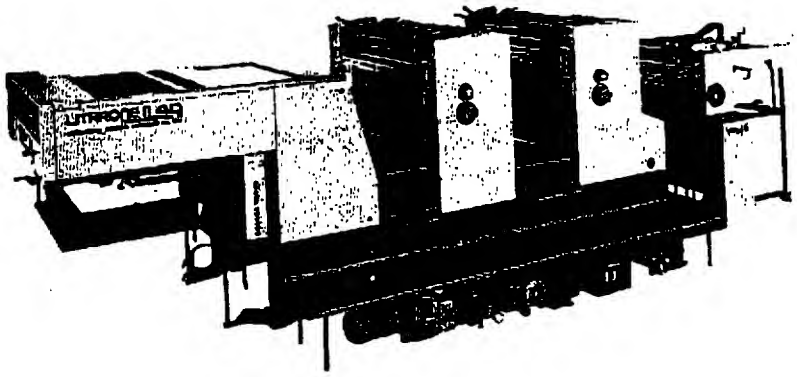
Most sheetfed presses can print on only one side of the sheet in a single pass. For the other side to be printed, the entire paper pile must be turned over and the paper run through the press a second time. There is, however, a type of sheetfed press that can print on both sides of the sheet in a single pass. The printing of at least one color on both sides of a sheet in a single pass through a press is called **perfecting;** any press that can do so is called a **perfecting press,** or **perfector.**

The most common sheetfed perfecting press is called a **convertible perfector.** Special reversing cylinders tumble



A two-color convertible perfector
Courtesy MAN Roland Inc., Sheetfed Press Division

the paper end for end between printing units so that the other side of the sheet is printed by the second unit. This type of press usually has the capability, by adjusting the reversing cylinder, to print either two colors on one side of the sheet or one color on each side in a single pass through the press. (Other color combinations are also possible.)



A two-color convertible perfecting press
Courtesy Komori America Corp.

With another type of sheetfed perfecting press that is used infrequently, the blankets from two printing units are in contact, with the paper passing between the two blankets. This type of press is called a **blanket-to-blanket press**, because the two blankets are in contact. No impression cylinder is

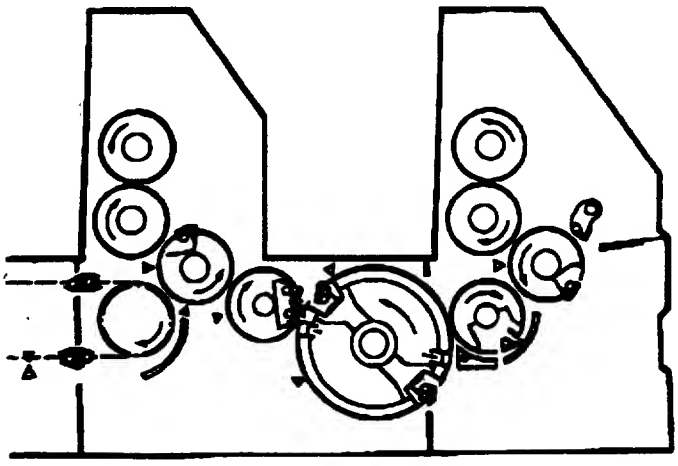
printed sheet is held by the common impression cylinder and successively brought into contact with each blanket. A press consisting of two semiopen units, then, would be capable of printing four colors on one side of the press sheet in a single pass.

Perfecting Press

Most sheetfed presses can print on only one side of the sheet in a single pass. For the other side to be printed, the entire paper pile must be turned over and the paper run through the press a second time. There is, however, a type of sheetfed press that can print on both sides of the sheet in a single pass. The printing of at least one color on both sides of a sheet in a single pass through a press is called **perfecting;** any press that can do so is called a **perfecting press,** or **perfector.**

The most common sheetfed perfecting press is called a **convertible perfector.** Special transfer cylinders tumble the paper end for end between printing units so that the other side of the sheet is printed by the second unit. This type of press usually has the capability, through transfer cylinder adjustment, to print either two colors on one side of the sheet or one color on each side in a single pass through the press. (Other color combinations are also possible.)

With another type of sheetfed perfecting press, the blankets from two printing units are in contact, with the paper passing between the two blankets. This type of press is called a **blanket-to-blanket press,** because the two blankets are in contact. No impression cylinder is needed; each blanket acts as the impression cylinder for the other. (Most web offset presses print blanket-to-blanket.)



A two-color convertible perfector *Courtesy Graphic Systems Div., Rockwell International*

Notice the extra-large transfer cylinder. See pages 26 and 27 of chapter 2 for information on how a convertible perfector operates.